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## Primary school vision screening involving teachers in Nampula, Mozambique.

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### Introduction

Childhood Blindness and Uncorrected Refractive Error are two of the main priorities of the Vision 2020 initiative.<sup>1,2</sup> Paediatric Eye Health was prioritised in the last national ophthalmology plan for Mozambique; training teachers to identify vision impairment in school children and distributing Snellen charts were among the planned activities.<sup>3,4</sup> There is no current plan for a national child eye care programme or existing human resource infrastructure to address the immediate challenge of child eye health in Mozambique. Some child eye health screening programmes have been carried out sporadically in some provinces; no data from these screenings has been published yet. Furthermore, the prevalence and incidence of refractive error, visual impairment and child blindness in Mozambique is unknown. Visual impairment and blindness in children has devastating personal, developmental, social and economic implications for the child, the family, the community and indeed, the nation.<sup>5,6</sup> According to Baltussen et al annual eye health screening in schools is a cost effective method of vision impairment intervention.<sup>7</sup>

### Aims

This study aims to design, implement and evaluate a simple vision screening test performed by teachers, to identify those in need of eye health services, among Mozambique's children (estimated at over 10 million).<sup>8</sup>

### Materials and methods

#### Setting and Participants

Primary School Screening took place in three schools (urban, suburban and semi-rural) in Nampula, Mozambique in September 2010 (Study 1), March 2011 (Study 2) and March 2012 (Study 3). Due to the volume of children in each school (over 1000) and lack of resources, children with obvious eye abnormalities or children identified by teachers as having an eye problem or poor vision were sought out and underwent screening along with a random selection of children. Teachers were selected to perform screening based on willingness to participate.

#### Study Procedures

Teachers were given a very brief tutorial on how to perform vision screening with the chart (figure 1(a)). They then performed the test monocularly on the child and indicated if the child could see well with the right eye and left eye (blue arrow Figure 2).

The child then underwent the full screening protocol (green arrow Figure 2). The results were recorded on the charts as seen in figure 1. These studies were carried out in classrooms with varying room illumination.

Care was taken to ensure the chart was located in the most even illumination but the illumination level varied in each room and throughout the day and was not measured. The non standardisation of illumination echoes the difficult working conditions of the study.



Figure 1. (a) Screening Chart, (b) Optometrist screening sheet, (c) Teacher screening sheet<sup>9</sup>

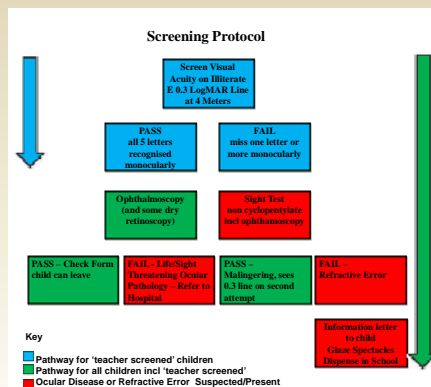


Figure 2. Schematic of screening process each child underwent

A subject was classified as myopic if either eye was myopic and hyperopic if either eye was hyperopic and they had not been previously classified as myopic, as per the Refractive Error Study in Children (RESC) protocol.<sup>1</sup> Myopia is defined as  $-0.50$ DS or more myopic spherical equivalent refraction (SER) and hyperopia as  $\geq +2.00$ DS SER. <sup>1</sup> Astigmatism is defined as over  $-0.75$  DC and can be present with hyperopia or myopia.

Ophthalmoscopy was performed on all children by qualified optometrists.

Children requiring refraction were refracted on site, those needing ophthalmological assessment were referred to the ophthalmologist in Nampula Central Hospital.



Figure 3. School children at various stages in the screening process

### Results

During Study 2 and 3, 206 children had the vision screening performed by 24 teachers who were eager to participate in the study. 17 children had the screening performed by 2 teachers. Of the 223 children screened the teachers identified 174 passes and 49 fails. On further screening (as outlined in Figure 2) 200 of these children were normal, 9 required refraction and 14 required referral for ophthalmological assessment. Further analysis of these results will be done at a later date.

Relative Prevalence of Refractive Error in Study 1 and 2

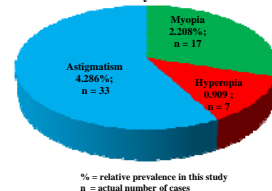


Figure 4. Pie Chart of the Relative Prevalence of Refractive error in school children in study 1 and 2.

From study 1 and 2; 770 children (408 male, 361 female, one sex not recorded), ranging from 5 – 18 years were screened in total. The mean ( $\pm$ SD) age was 11.5 ( $\pm$  ) years.

The ocular abnormality detection rate was 10.65%, comprising 7.40% of children who required spectacle provision, and 3.25%, who required referral to the Ophthalmology Unit.

The pie chart above shows that the overall prevalence in Study 1 and 2 was 2.21%, 0.91% and 4.29% respectively. The distribution of myopia, hyperopia and astigmatism among children provided spectacles was 28.57%, 12.5% and 58.93% respectively. The figure for hyperopia may be low because failure of distance vision screening as the refraction performance criteria.

Ocular Abnormality Detection Rate of Eye Conditions in Nampula School Children

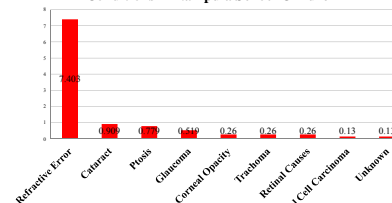


Figure 5. Bar Chart with the breakdown of ocular abnormalities detected

The most common causes of referral for ocular health abnormality included, cataract (26.92%), ptosis (23.08%), and glaucoma (15.38%).

### Conclusions

These studies found that there is a cohort of students attending school in Nampula who are in need of eyecare service provision.

Refractive Error was present among this population tested in these studies but none of the children observed wore spectacles.

The training received by these teachers was very brief but teachers appear to have an adequate level of education and interest to undertake vision screening in children. The ideal teacher profile for Vision Officers within schools is trainee teachers who can be taught the basics of vision screening and eye health through their existing studies.

From interviews carried out with school principals, department of health and education and teacher training institutes there seems to be support for development of a low cost, school based vision and ocular health screening project.

Teachers are suitably placed in the community to become advocates for eyecare and can encourage students to become aware of eye conditions among their peers and in the community.

This study will inform a provincial pilot teacher screening project for Nampula, which will include the addition of "Eye Health" to teacher training modules at the teacher training institutes in Nampula, as part of a plan to develop a national child eye care programme for Mozambique.

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### For further information

Please contact [aiofe.phelan@di.ie](mailto:aiofe.phelan@di.ie). More information on this and related projects can be obtained at [www.mozeyecare.org](http://www.mozeyecare.org)